TCS/17/31 – Preclinical testing of novel allogenic GMP grade mesenchymal stromal cells to promote the long term engraftment and function of human islets

Islet transplantation is effective in stabilising blood glucose control in Type 1 diabetes, but people rarely come off insulin and over time islet transplant function decreases. Two to three donor pancreata are required per person as in the process of islet transplantation into the liver, most islets are lost because of immune rejection, inflammation and a failure to “engraft” that is form blood vessels with the liver. Mesenchymal stromal cells (MSCs) decrease inflammation, promote blood vessel formation and decrease the rejection of transplanted organs.
We have shown that when islets are co-transplanted with human-MSCs into the kidney in a mouse model without an immune system, there is improved engraftment of islets, tighter glucose control for a longer period of time and improved graft vascularity. Our aim is now to emulate the human situation and transplant islets in a mouse model with an immune system using the clinically relevant route of transplantation into the liver to determine 1) the effectiveness of islet+MSCs on controlling glucose 2) the way in which islet function is improved and 3) the safety of these MSCs. If successful this would lead to clinical trials with these human MSCs that are already approved for use in man.